CLAIMS

1   1.   A method for arranging a plurality of orders for printed articles each of which

2   contains one or more printed articles, in order to reduce wasted space when printing the

3   orders in multiple columns, the method comprising the steps of:

4   obtaining a plurality of orders for at least one printed article;

5   sorting the orders according to the number of printed articles in each order to

6   produce a sorted arrangement of the orders; and

7   for each successive order in the sorted arrangement of orders placing the order

8   in a column which currently has a lowest number of total printed articles.

1   2.   The method of claim 1 further comprising the step of:

2   placing the first K orders in the sorted arrangement of orders in columns 1 to K

3   where K is the total number of columns.

1   3.   The method of claim 1 further comprising the steps of:

2   determining the number of printed articles in a Ith group in an Mth column;

3   determining the number of printed articles in the Mth column;

4   determining the number of printed articles in a Jth group in a Nth column;

5   determining a number of printed articles in the Nth column; and

6   exchanging the Ith and Jth groups between the Mth and Nth columns if:

7    $(L(M)>L(N)$ AND $L(I,M)>L(J,N)$ AND $L(M)-L(N)>L(I,M)-L(J,N))$ OR

8    $(L(M)<L(N)$ AND $L(I,M)<L(J,N)$ AND $L(N)-L(M)>L(J,N)-L(I,M))$

9   where $L(M)$ is the number of printed articles in the Mth column,

10    $L(N)$ is the number of printed articles in the Nth column,

11    $L(I,M)$ is the number of printed articles in the Ith order of the Mth column, and

12    $L(J,N)$ is the number of printed articles in the Jth order of the Nth column

13   is true.

1   4.   A method for rearranging a data structure representing a multi column

2   arrangement of a plurality of groups of printed matter the method comprising the steps

3   of:

4   determining the number of printed articles in a Ith group in a Mth column;

5   determining the number of printed articles in the Mth column;

6   determining the number of printed articles in a Jth group in a Nth column;

7   determining a number of printed articles in the Nth column; and

8   exchanging the Ith and Jth groups between the Mth and Nth columns if:

9         $(L(M)>L(N)$ AND $L(I,M)>L(J,N)$ AND $L(M)-L(N)>L(I,M)-L(J,N))$ OR

10        $(L(M)<L(N)$ AND $L(I,M)<L(J,N)$ AND $L(N)-L(M)>L(J,N)-L(I,M))$

11   where $L(M)$ is the number of printed articles in the Mth column,

12        $L(N)$ is the number of printed articles in the Nth column,

13        $L(I,M)$ is the number of printed articles in the Ith order of the Mth column, and

14        $L(J,N)$ is the number of printed articles in the Jth order of the Nth column
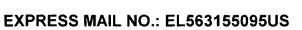
15   is true.

1   5.   The method of claim 4 further comprising the step of

2   iteratively selecting different combinations values of M and N.

1   6.   The method of claim 4 further comprising the step of:

2   iteratively selecting different combinations of values of I and J.

1   7.   A computer readable medium containing programming instructions for

2   rearranging a data structure representing a multi column arrangement of a plurality of

3   groups of printed matter, including programming instructions for:

4   determining the number of printed articles in a Ith group in a Mth column;

5   determining the number of printed articles in the Mth column;

6   determining the number of printed articles in a Jth group in a Nth column;

7   determining a number of printed articles in the Nth column; and

8   exchanging the Ith and Jth groups between the Mth and Nth columns if:

9          $(L(M)>L(N)$ AND $L(I,M)>L(J,N)$ AND $L(M)-L(N)>L(I,M)-L(J,N))$ OR

10         $(L(M)<L(N)$ AND $L(I,M)<L(J,N)$ AND $L(N)-L(M)>L(J,N)-L(I,M))$

11   where $L(M)$ is the number of printed articles in the Mth column,

12         $L(N)$ is the number of printed articles in the Nth column,

13         $L(I,M)$ is the number of printed articles in the Ith order of the Mth column, and

14         $L(J,N)$ is the number of printed articles in the Jth order of the Nth column

15   is true.

1   8.   A computer readable medium containing programming instructions for

2   rearranging a data structure representing a multi column arrangement of a plurality of

3   groups of printed matter the computer readable medium including programming

4   instructions for:

5   determining the number of printed articles in a Ith group in a Mth column;

6   determining the number of printed articles in the Mth column;

7   determining the number of printed articles in a Jth group in a Nth column;

8   determining a number of printed articles in the Nth column; and

9   exchanging the Ith and Jth groups between the Mth and Nth columns if a

10 boolean expression:

11          $(L(M)>L(N)$ AND $L(I,M)>L(J,N)$ AND $L(M)-L(N)>L(I,M)-L(J,N))$ OR

12          $(L(M)<L(N)$ AND $L(I,M)<L(J,N)$ AND $L(N)-L(M)>L(J,N)-L(I,M))$

13   where $L(M)$ is the number of printed articles in the Mth column,

14          $L(N)$ is the number of printed articles in the Nth column,

15          $L(I,M)$ is the number of printed articles in the Ith order of the Mth column, and

16          $L(J,N)$ is the number of printed articles in the Jth order of the Nth column

17   is true.

1   9.   A system for producing custom printed articles comprising:

2   a high speed printer;

3   a server electrically coupled to the high speed printer the server including:

4   a processor programmed to:

5   determine a number of printed articles in a Ith group in a Mth column;

6   determine a number of printed articles in the Mth column;

7   determine a number of printed articles in a Jth group in a Nth column;

8   determine a number of printed articles in the Nth column; and

9   exchange the Ith and Jth groups between the Mth and Nth columns if a

10   boolean expression:

11   (L(M)>L(N) AND L(I,M)>L(J,N) AND L(M)-L(N)>L(I,M)-L(J,N)) OR

12   (L(M)<L(N) AND L(I,M)<L(J,N) AND L(N)-L(M)>L(J,N)-L(I,M))

13   where L(M) is the number of printed articles in the Mth column,

14   L(N) is the number of printed articles in the Nth column,

15   L(I,M) is the number of printed articles in the Ith order of the Mth column,

16   and

17   L(J,N) is the number of printed articles in the Jth order of the Nth column

18   is true.

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